

1/16

GAATTCTGTGCCCTCACTCCCCTGGATCCCTGGGCAAAAGCCCCAGAGGGAAACACAAACAGGTTGTTGTA
ACACACCTTGCTGGGTACCACCATGGAGGACAGTTGGCTTATGGGGGTGGGGGTGCTGCGGCGCACGGA
GTGACTGGTGATGGCTATCCCTTCCTTGGAACCCCTCCAGCCTCCTCTTAGCTTCAGATTGTTTATTGT
TTTTTACTAAGACCCTGCTCTTTTCAGGTCTGTTGGCTCTTTTAGGGGCTGAAGAAAGCCGAGTTGAGAAGG
GATGCAAGGAGGGGGCCAGAAATGAGCCCTTAGGGCTCAGAGCCTCCATCCTGCCCAAGATGCTCTACAG
CTTGTGCTCCTGGGGTGCTAGAGGCGCACAAAGGAGAAAGTTAGTGCTTCCCTTCCATATCCCGTTTCAT
CAGCCTAGAGCATGGAGCCCAGGTGAGGCGCTGCCCTGGGAGGGGCCCCTGAGCCAGGAAATAAACATT
TACTAACTGTACAAAGACCTTGTCCTGCTGCTGGGAGCCTGCCAAGTGGTGAGACAGGACTAGTGCA
CGAATGATGGAAAGGGAGGGTTGGGGTGGGTGGGAGCCAGCCCTTTTCCTCATAGGGCCTTAGGACACC
ATACCGATGGAACTGGGGGTACTGGGGAGGTAACTAGCACCTCCACCAAAACCACAGCAACATGTGCTGA
GGATGGGGCTGACTAGGTAAGCTCCCTGGAGCGTTTGGTTAAATTGAGGGAATTTGCTGCATTTCCCAT
CTCAGTCCATGCCCTCCACAGAGGCTATGCCAGCTGTAGGCCAGACCCCTGGCAAGATCTGGGTGGATAATC
AGACTGACTGGCCTCAGAGCCCCAACTTTGTTCCCTGGGGCAGCCTTGGAAATAGCCAGGTCAGAAACCAG
CCAGGAATTTTCCAAAGCTGCTTCCTATATGCAAGAAATGGGATGGGGGCCCTTTGGGAGCACTTAGGGAAG
ATGTGGAGAGTTGGAGGAAAGGGGGCTTGGAGGTAAGGGAGGGGACTGGGGGAAGGATAGGGGAGAAGC
TGTAGCCTGGAGAGTAGCCAAAGGATCCTGAGGGAATGGGGAGCTGAGACGAAACCCCCATTTCAT
TCAGAAAGATGAGCTATGAGTCTGGGCTTGGCTGATAGAAGCCTTGGCCCCCTGGCCTGGTGGGAGCTCTG
GGCAGCTGGCCTACAGACGTTCCCTAGTCTGGCGGGTAGGTTTGAATCATCAGCAGGCCCTGGCCTCC
ACCCGCCCCCAGCCCCCTGGCCTCAGTTCCCTGGCAACATCTGGGGTTGGGGGGCAGCAGGAACAA
GGGCCTCTGCTGCCCAGCTGCCTCCCCCTTTGGGTTTGGCAGACTCCACAGTGCATACGTGGGCTCCA

FIG. 1A

ACAGGTCCTCTCCCTCCAGTCAC TGAATAACCCCGGAACACACAGCTTCCGTTCTCA GCTCCACAA
ACTTGGTGCCAAATCTTCTCCCTGGGAAGCATCCCTGGACACTTCCCAAAGGACCCAGTCACTCCAG
CCTGTGGCTGCCGCTCACTTTGATGTCTGCAGGCCAGATGAGGGCTCCAGATGGACATTTGTCA GAGGG
ACACACTGTGGCCCTGTGCCACAGCCCTGGGCTCTCTGTACATGAAGCAACTCCAGTCCCA AATATGTAG
CTGTTTGGGAGGTCAGAAATAGGGGTCCAGGAGCAAACTCCCCCACCCCTTTCCAAAGCCCATTC C
TCTTTAGCCAGAGCCGGGTGTGCAGACGGCAGTCACTAGGGGGCGCTCGGCCACACAGGAAGCTGGG
TGAATGGAGCGAGACGCTCTTCGAGAGTGAGGACGTGTGTCTGTGTGGGTGAGTGAGTGTGTGCGTG
TGGGGTTGAGGGTGTGGAGCGGGGAGAAGGCCAGGGGTCACTCCAGGATTTCCAAACAGATCTGTGTGTC C
CTCTCCCCACCCGTCCCTGTCCGGCTCTCCGCTTCCGCTTCCCTGCCCCCTTCAATATTCCTAGCAAAGAGGGA
ACGGCTCTCAGGCCCTGTCCGCACGTAACTCACTTTCCTGCTCCCTCTCGCCAATGCCCAATGCCCGGGCGC
GTGTCTCTGGACAGAGTTTCCGGGGCGGATGGGTAATTTTCAGGCTGTGAACCTTGGTGGGGTCTGAGC
TTCCCTTCATTGCGGGGGCTGCGGGCCAGGCTTCACTGGCGTCCGCAGAGCCCGGGCCCCGAGCCCGCG
TGTGGAGGGCTGAGGCTCGCCTGTCCCCGCCCCCCCGGGCGGGCGGGGGTCCCGCGCGGGCGCGG
AGCCATGCGCCCCCTTTTTTTAAAGTCGGCTGTAGCGGGGAGGA

L mRNA start site

GCCGGTAGCTCGGAGTCTGTGGCGCTGGGGCTAGCACCGCTCTGTGGGAGCGCAGCGGTTAGG
TGGACCGGTCA GCGGACTCACCGGCCAGGGCGCTCGGTCTGGAATTTGATAATTCATTGATCCGGGTTT
ATCCCTCTTCTTTTCTTAAACATTTTTTTTTTAAACTGTATTGTTTCTCGTTTTTAATTTAATTTTGCT
TGCCATTCCCCACTTGAATCGGGCCGACGGCTTGGGGAGATTGCTCTACTTCCCCAAATCACTGTGGATT
TTGGAAACCCAGCAGAAAGAGGAAGAGGTAGCAAGAGCTCCAGAGAGAAGTCGAGGAAGACAGAGACGGG

FIG. 1B

3/16

GTCAGAGAGCGCGGGCGTCCGAGCAGCGAAAGCGACAGGGGCAAGTAGTGACCTGCTTTTGGGG
GTGACCGCGGAGCGGGCGTGAGCCCTCCCCCTTGGGATCCCGAGCTGACCAAGTCCGGCTGACGGACA
GACAGACAGACACCGCCCCCAGCCCCAGCTACCACTCCTCCCCGGCCGGCGGACAGTGGACCGCGG
GGGAGCCCGGGCAGGGGCCGGAGCCCCCGAGCGGGGTGGAGGGGTCCGGGCTCGCGGCGTC
GCAC TGAAACTTTTCGTCCAACTTCTGGGCTGTCTCGCTTCGGAGGAGCCGTGGTCCGCGCGGGGAAG
CCGAGCCGAGCGGAGCCCGAGAGTAGCTCGGGCCGGAGAGCCGACGCCGAGGAGGGGAGGA
GGAAGAAGAGAAGGAAGAGAGGGGGCCGAGTGGCGACTCGGCGCTCGGAAGCCGGGCTCATGGACG
GGTAGGGCGGGTGTGCGCAGACAGTGCTCCAGCCGCGCGCTCCCGAGCCCTGGCCCGGGCTCGG
GCCCCGGAGGAAGTAGCTCGCCGAGGGCGCGAGAGCGGGCCGCCACAGCCCGAGCCGGAGAGG
GAGCGGAGCCGCGCGGCCCGGTCCGGCCCTCCGAAACCATGAACTTCTGTGCTGTGGTGCATTGG
L translation start site

AGCCTTGCCCTTGCTGCTACCTCCACCATGCCAAGGTAAGCGGTCGTGC

FIG. 1C

4/16

CCGGGCTGAGCTCAGTCATTTTGCCCTGAGGACTATAAGTGGACTATTATGCAGCACTTCTTTTATTATTATT
ACTATTAAGCCAAGTAAGTCTTAAACAGCTAACACCTGAGCTGGTGGCTCTGAGAAAGCCTCTTCACTCCTTCACGG
GAGACGGACCATTCACATGAAGATCCTACATTTGTTGTTTTTTTTTTGGAGGTGCAAAAAGGTCACGTGTTAGG
AGGCTTTCGGGCTTTGCTCCTCCTCAATTTATTACCCCTCCAGTGGCTGATGACGTACAGGGAGACTTCCA
CCCGATAATGACATGGCTTTGTTTATTTCACAAATCCCAGCATTTACTGTTAATCAGACCCAGTTTGAACCCACCC
CCAAAGGGCTTGCAGTCTAAACAGCTCACTTTGCTCAGCCTCTTCCCTGAGGTCAAGCACTGCTTTGCTAAGGCCGA
CATCAGCTCATGCCCCATTTTACAGATGGGAAACTGAGAAATGCTAAGAAAGTGAATAAGCTAAGTTATACAACATA
ACAGGGAGACAGCCTAAACTTGAAACCCAAACCGGAAGCCCAACATGCCCCAAGCCTTCTCGAACCCAGGACTTG
GCAAAGCGGGCTCCTGGGGTAAAGCATGGCAGAAAGGCTTTGGGTCCAAGCTAAGTGAGGGTCCCTGTTCTAGAT
CACCTGGCCAGGTGCAGTGGCTCATGCCCTGTAAATCCCAGCACTTTGGGAGGCTGAGCGGGAGGATTGCTTGAGCT
CAAAAGTTTGAGTCCAGCCCCGGGCAATACAGCGAGACCTCGTCTCTACTAAAAAGAAACAAAAAATTAGCTGAG
TGTGTAGTCCCAGCTACTCAGGAGACTGAGGCTGGAGGATTGCTTAAGCCTGGAAGTTTGAGGCTGTAGAGCTATG
ATAGAGCCACTGCACCTTAGCCTGGGCAATGGAGCAAGATACTATCTCAAAAAAATAATATATATATAGGTCC
CCTTGTCCTCTGCTGAGAAAGTAACAGATCTGGAAAAGATTAGTCACCTTGGTCCAACATACTTCTTTCACATAA
AGAAAAAAGGCAATGCAGACCTTCCCATGGGGGCAGCTCTGCCCTGAGGCCCTTTCAGAGTACCTCTGTTGTCT
GCCCCGGGCACAGTGGCAGATTGGCAGGGCAGCTTGCACTGAGGATTGCTGATGGATGAGCTCCTAGTGTACCT
AGCCAGCCATTTACTCACAAACAGCTATTGAGCACCTACTATGTGCCCCAGCACTGGAGGTACAACCTGGCAACAACA
CAAAATCCGGGCTTGCTCCATGGAGGTGACAAATCTAAATGCGGTGGAGGGTCAGCTAACAAAGTGCAGAAGGTTCTCT
TAAGAGCTCAAGAAGCTCCAACCAAGGACTGGGCAGGGGATCCAGAAGGCAATCCCCGAGTGGCTACTCCAATG

FIG. 2A

5/16

GAGTGGCTTCTCCATTTCAGGCAAAACCTGAATGGGATAAGTCATTGGCAGGAAGATCTGGGGCCGGGGTTCATCCAG
TGGGAAGGGAGAGATGACGGGTCAGCATGGCGGGAACACACAGGAGCAGAAAGGAAGCAGGTGGGAAGCCAGGTCA
AGGGCCAGGGCACGGAAGGGTTCAGATGCAGATAAGTGAAGTCTTCCCTGGTGCATCCTTTCATCCGCAATTTCATC
CTTACCTGTGCTTTTGTGCTCCATTGCATTGCACAGCTGAGGAGGCCAGGGCCTGCGGAGGTTGAGAGTGTGCTCAGGG
AGCCCCGGAGCAAAAGTGAAGCCAGATTCCAGATCAGTTCTGTGCTGGGAATTCCCAGCTCCCAAAAGCCCTGCTGG
CTGTCACTCCCCAGTCAACCACAAGCACCTATCCTGTGTGGTGGCCCTGCAGTTCTGGGAGATATATCAGCTGSCCT
GCAGCGTCCTTTGCTGAACTCACAGCAAAATAGGAGAGACAGGAGGGGTCTCTGGGAAGCCCTAAATTGAGCTTGC
TGTGGGAGTCTCTGGGAAGAAAGGAGCCTCATCCTATCAAAAGCCGGGGGAAGACATCAGAGTCCCTCTGCTCAGG
TCAGCTGGCACAGGTGGGTCTCCAGGCCCTGGGTCTCACTTCCCCAGAGGGTGTGTTCCGGTGGCCCCAGGCTGAGG
GAGGAAAGCCCCACCTCCCATGTCTATTTGCAAAATGGGAGTCAGGGACCTAGAGATGGAAGACAAACACAGCAAAGT
GAGGGATGGGTCTTAGGTCCCCTGCAACCTTGCAACCTGCACCCCTGGCCAACGATGTCTATTTGGCACCCAGATCTGC
AGGCTCATCTGGGGGACCCAGGACCCAGAGGCGCGGTTGCATCTCGAAGCTGTGAGCTGCAGCCCCAGGAAGG
TCCAGGTCGTGGGTGGCGCTGCCCCAAGCAGGCTGCAGGGCCCCAAGGAGGAACAAGATCCTCTCAAGGGGTGCGGAGC
TGAGGTTCCGGTCCTGCCAAAGCCACTTGATGACCCCCCAAGTGGCCCCCTTTCTGCACCTCAGAGAAGAGCCCTCA
AGCCTCCAGGTCCCTCCAGGGGCACGAATAAGCCCCAGCAGGGTTCTGAAGGGTCCCAGGAATCTCCCTGTGG
GGATGCGGTGGAGTGGAGAGGCTGCGGTGGCTGGGGACATCTCTGGTCAAGGTGCTGGTGGTATGAGAGATG
GGGTAGGCACCAAGCCCCCTGCAGCTGTGGCTAGCGGGCCTGCAGGAAGGGCCAGGCAGGCTCCTCAGGGACCAC
AAAGAACAGGGGTTTTCACACCTAGGTGGCCCTGCATCTAGCTAGGCCAGTCCCCATCAGGCCATAATGGGCACAG
TGGGAGGTAGAACCATGAGTGAGAGAGGGGAGGCTTCCAGAGCCCTGGCCCTGGTCCCTGCTAGATTGAGGGCTCT
GGCTATGGTACATGGATATTTCTGCTGTGGAATCAAAAGGAGCAGGGGATGCTGAATATCCCCCTCTGGCCCCATATGCC

FIG. 2B

CTGCTACCTGTCCCTTCACGGAAGGTGTGTGTAGGGGTGCAGGACCAGGCCTCCCTGGGTGCATCTCTGCCA
CCTTGCCCTTTGGCTCAGGTGGACCTCCACCAGGTATTCAGAACTCCAGCCAGAAACGCCCAAGCCTGTGGGGC
CAAGACCTAGGGGTGGGGTGGCCCTCCCTCCCGCCTGTAGCCAAAGGTCTCCCTTGCCAGCCAGGCCCCGGT
GTCCGTTACTGCTCTTATCCACCCCTCCTTCCAGGCCCGTCTCAAGGCCCCAGCAAGAAAGTTCCTCCGTG
AGCCTCCGAAAGGCGAAGGCGAGGCGAGCAGCCGCTGGCTTCTGCGCCCACTAGGAGCTTCGGATGCCCGAGTTAGG
GCTGCGCCAAAGCGGCCGAGCAGAGAGGAGACGGGGACGGGGACAGGCAGGGACAAAGTGCAGAGGCAAAACT
GGCTGAAAAGCAGAAAGTGTAGGAGCCGCCAAAGGGCGGGACGAACAGTCCGTGGGCCGGGCGGAGCCAAAGGTGG
GGCCGGGGTCCCTCCAGGTGGCACTCGCGGCGCTAGTCCCCAGCCTCTCCCTTCCCCCGGCCCTGATTGGCAGG
CGGCTGCGACCAAGCCGGAACGCCACAGGCCCGGGCGCCAGGAGAACCGAACCGCCCCCGCGGGAGCGGG
CGAGTAGAGGGGGCGCGGCTATATATAGCGGCTCGGCTCGGCGGGCTGCGGCTCAGGGAGGCGCGCAC
TGCTCC**TC**AGAGTCCAGCTCCAGCCGCGGCTTTCGCCCCGGCTCGCGCTCCATGCAGCCGGGTAGAGCCCCG
LmRNA start site
CGCCCGGGGGCCCGTCGCTTGCCCTCCGCACTCTCGTTGCGCACTCCCGCCCGAGGTCGGCCCGTGCGCTCCC
GCGGGCCGCCACAGGCGCAGCTCTGCCCGCCAGCTTCCCGGCGCACTGACCGCTGACCGACGCGCCCTCGG
GCCGG**ATG**TCGGGGCCCGGACGGCGCGGTAGCGCTGCTCCCGCGGTCTGCTGGCCTTGCTGGCGCCCTGGG
L translation start site
CGGGCCGAGGGGGCGCGCCGCACTGCACCCCAACGGCACGCTGGAGGCCAGCTGGAGCGCGCTGGGAGAG
CCTGGTGGCGCTCTCGTTGGCGGCCCTGCCGTGGCAGCGCAGCCCAAGGAGCGGCCGCTCCAGAGCGCGCGGC
GACTACCTGCTGGGCATCAAGCGGCTGCGGGCGCTCTACTGCAACGTGGGCATCGGCTTCCACCTCCAGGCGCTCC
CCGACGGCCGATCGGGCGCGCACGGGACACCCCGCACAGTGTGGCGCGGCCAGGCGCGAAGGGCGCGGGG

FIG. 2C

7/16

CGGGGGCAACGGCCGCCGGGCCAACCCGGCTCAGTCACACTCTGAGACCCCTCGGGGGCACTGTCTGGGGGCCCC
GGGAACCGGGGGGACTCGGGCTCCGGTCCCTTCTGACGGGGGCTGGGGACCGAGACACTCTTGCTCCGGCAGC
CCAGCGCAACCCCTGAGGTCGGGCGCCGCTCCCGCTTCAAACTCGGGCTCCGAGCGCCGAATTCAGCGCCT
TCGCCCCGTGGGCACAGGGCGCGGGTGCAGCCACAGGGGGCCCGAGACACGCGCCCCGGGCTGGCCCCAGGCTGGG
AACCCTGGGGTCGGGCTCGGCTCTGAAGTCCGGACTGGGTCCGGCCCGGGGGTCCCCACACAGGCAAGCT
AATCTAGCTAGCGAGGCTTGGGCTCCGGAGGCCCTAGAGGCGAGCTTGGGCTCTGGAGGCCCTTGGGGGCGGCT
GCGCCGGGAACCCCTGGCCCTTTATCCCCAACCCACCCCAAGAAATAGGTTCCCCGGAGGCGAACAAGCCGAGGGC
GGAGTGGGCCAGGATCACCTGCCCCGCAATGACCTGCGCCCCCGCCCTGCTGGAGCTCTGCCCCGTGGA
GCGGGCGGTGAGCATCTTCGGCGTGGCCAGCCGGTCTCTCGTGGCCATGAGCAGCAAGGCAAGCTCTATGGC
TCGGTGAGTACCGCAGGGTCTGGCTAGGCACCTAGTTGGGAACAGCGGACATGGCTAGCAGGCTCGTGGCTTCTC
CAGCCCCACCTGTGCTGGTCTTGGAGGGTGGCAGGTCACAGGTCACGGACCGGCAGGCCCTCCCCAGACAA
AGGAAGCAGCCCCAAGCAGGAACAATGAGTTCTTGCCATCCCTGAGTGGGCCCTCCAGACCGAGGAAAGGGC
GCTATTGAGAGCCCTTCCCTTCTCTAGTCCAGAGGGTAGGTCTCAGTGTGGAACCTGCGGGCTTGAGGCTGGACA
CGCAGGGAATGAATTCTCTGGCTGCTAGGTGCAGGGCAGGTGGTGAGAGCACCAAGCTGTGTGGGCTGGCCATGTC
CCCTTCTACCCCTGTGGTCTTGACACCTTAAGTCTCAGCAGAGACATCTCAGCCCAGGGTGGGGGTGGGAC
AGAAGGGGTTCTGACCCCTGGCTTCAAGGCTGGGTACCTTGCCCCAAGAGGTGCCCCAGCCCTGACACTGCCCTGCT
TTGCTGCAGCCCTTCTTCAACCGATGAGTGCACGTTCAAGGAGATTCTCCTTCCCAACAACATAACGCTACGAGT
CCTACAAGTACCCCGCATGTTTCATCGCCCTGAGCAAGAAATGGGAAGACCAAGAGGGAACCGAGTGTGCCCCAC
CATGAAGGTACCCACTTCCCTCCCGAGGCTGTGACCCCTCCAGAGGACCCCTTGCCTCAGCCCTCGGGAAGCCCTGGG
AGGGCAGTGCCGAGGTCACCTTGGTGCACTTCTTCGGATGAAGAGTTTAATGCAAGAGTAGGTGTAAGATATTT

FIG. 2D

8/16

AAATTAATTATTTAAATGTGTATATATTGCCACCAAATTATTATAGTTCTCGGGGTGTGTTTTTAATTTTCTGG
GGGAAAAAAGACAAAAACAAAAACCAACTCTGACTTTTCTGGTGCAACAGTGGAGAATCTTACCATTGGATTTC
TTTAACCTTGTCAAAAGTTGTACGAGTGTGCTGCTATTCTGTGTTTTTAAAAAAGGTGACATTGGATTCCGATGTC
ATCCCCGTAGTATGGCGTGGAGCATCTCTGTCTGGAAGCCCCGCTGAGGCTTGGCAGCCAGTTTCAGGGAGCT
CCCAGGCTTGGCTCTCGGCTAGCATCCCTCAGAGGCCCACTCCCTTTGTGCCCCCTGTGCTATTAATCGGGACATATC
GGTTACTTTCGGGTACAGAAAGTGGGTGTTGAAGTCCCTCGCTGCCACTCTGTTTTTTAGATCTGCCAAGACTGACC
TTTGAACCTTTCCTGTAGTCAATCTTCTCGATCTACCAGATGGGAGAGACCCCTTGGACAACTTTATAAACTCCTGT
TTGCCCTTTTTTGGATCAGCGACAGCCCCCATCGCTGTGACTATTGGGGAAGAAAGACGAAGCTCTTTTCATAAAATTCCA
TGGAGAGGAATCAATATCCCACTGGAAGGCTAGAAATGGACAAGATAGTGTATTGCAATCACAAACAAAACCCCTA
GTGATGAAAAATAATTGTGATGGCAGATGCTCTGATGGTGTGATAGAAATATGTTTTTGAAAAACAAACCATCGAA
CCCCCGCCCCACCCCCAAACGGGCTTCCCCTGTGTTTAGGGAGCTTTGGGCTAGAACTAGCTACGATTTTTAGGT
GAAATGTCCCTTGTAATTGTACAAAGCACTTGGTGCACTGTTTGGTGAGCAGCCTGCTGCTTTCTGATGCATTCC
CTGTTTAAGTGCGTTTAAACATCTACCTCACAAAGCCCTGAAACCCAGGCAAAACCCACAGAAAGCTCATACCCGGT
GCAGGAGTTTGCCATCCCCAAGTGGCTTTTTTCCATATGTAGCCAAAAAGGATTGCAGATAGCGTCCGTGCGTCCC
ATTGGAACCTTGTACGTTTGAGCTATCTTTACCCCTGTGATTACTTTTAGTAAGGTGATCATGGTGAAAAATATT
TGCAGACAGCTGTTACAGTACACTATATGGTCACCAAGTAACCTTATATTTTCTTTATATATTTTACAAATGTAA
CCCCGTGTCATTGAAGCAACCCGTGGAAGAGGCGGTCGGTGATGTTTAAAAAAAGTTCGAGGTGATGGCAACAT
TTAATTTTAAATGAATGACTTTTTTAGAGTTTATACAAAAATGACCTTAGCTTGCTACCAGAAATGCTCCGAATGTTTC
GTCAAGACTTTAATACTCTCCTAGGATGTTTCTGAACTGTCTCCCCGAATTAACTTTATGGGAGTCTACAGACAGCA
AGACTGGAATAATCTGATGGAGTTTTTGTCTTTTCACATTCCTTTTGAAAAACTCTTTTGTTCGAATGCAAAATCATCGA

FIG. 2E

CTTAAATACTATTCTTAACCAAGGCCCTGGAAGAAAGACACACTTGCAAAGCCGCTAAGACAGGACCAACACATCT
TAAACTGCTGTTCCCTACCATGCACTAAACTGTTTTTAAGTTTTTAAACCAACACCTAGGCTCCAGGAGTGTTCAGGA
AAGATGGTGTGTGAGGCTCCTCATGCTGTTTTGGCGTTGGGGGTGTGGAGGGATCATCCGTCGACTTTCCTGAATTT
TAATGTATTCACTTAGTAACAACCATGATTGTCTTAAATGCCCTTAAATTATATGAGATTTCCTGTCTCAGAGCC
CAATCAGATTGTCAGGAATTACATGTGTAGGTTTGATCACCCCTTGACCACCTTCTTATAGATATTTCTTCAACAA
ATCATGTGTGATGCCCTGTAGGAACACAACTGTACCTTTAAAAATATTGTTTTCATATTGCTGTGATGGGATTCGAG
GTTCCCTGATGTGCCACTGTTTTTCAGAACTCTGTAGTTTTTATACAGGTGCCGACCCCTCGTTGTGATGTATGTGCTGT
GCACATTGACATGCTGACCGACAATGATAAGCGTTTTATCGTGTATAAAAAGACACCACTGGACTGGATGTACACAA
CTGGGAAAGGAATTAAAGCTATTAAAAATTGTGCCCTTGAAATGC

FIG. 2F

10/16

AATGGTATTATAGGGTAATGAGTATCCATCTAGTATTTAAAGTATTTACATAAAATTCAGTACTTAAAGTAATCTCT
TTACAAGTATTTTATCAAAAACCTTTTCAGACACAAATTTTGGGGATTTATTCAAACTGTTTAAACACTTAAGAAG
TACTGGCTTACCTTGGAGATACTGCTCGTTTGGTTTCAGACCACTGTGATCAAGCAAAAATCGCAATAAAGCAAGT
TACATGAATTTTTCGTTTCCAGTGCATATAAAAGTTACACAGCAGACTATTAAAGTGTGCAACAGCATTATG
TTTAAAAATGTCCATACCTTAACTTAAAAATACCTTATTTGTTAAAAAATGCTAACGATCATATAAGCCTTCAGCGA
GTGATAATCTTTTTCGTGATGGAGGGTCTTGCTTGATGTTTCAGAGCCTTGCTGTGGCTTTGGCTTAAAGCTTAAAGG
GAATATTGCAGCTGGTTTGATCTTCTATCTAGACTGCTCAAAATTTCTGCATATCAGCAATAAGGCTGCTCTGCTC
TCTTATCATTTGTGTGTTCACTGGAGTAGCACTTCTAACTTGCTTCAAGAACTTTTCTTTTGCAATTTGCAACTCGG
ATAACTGGTGCAAGAGGACTGGCTTTTGACCTAACTCATCTTTGGGCATGCCTTTCCCCAAAAGCTTAATTTATTT
CTAGCTTTTGATTTCAAGGAAGAGACGGCAACTTTCCTTTCACTTGAGTACTTAGAGGTCAATTGCAGGGCTATC
AATTGGCCTAATTTCAATAAATGTGTGTGTTTAGGAAAATAGAGAAAGCCTGAGGGAGGGAGAGACGGGTGAACAG
CTCGTCAGTGGAGTAGTCAGAAATACACACATGAATGGATTGGGTTGTGGTTTGTGGTCCCCAAAACAATTT
ATGGCAGTAACATCAAAAGATCACTGATCACAGATCATCATGTAAATAATAAGGAAATATTTGAAATATTGCAAGA
ATTACCAAAATGTGACACGGAGACACAAAGTGAGCACATGCTGTGGGAAAAACGGCACCAACAGACTTGCTCAATT
CGAGGACACCACAAAACCTTAATTTGTAAAAACACATTATCTGTGAAGTACAATAAAGTGAAGGCAATAAAATGAT
GTATGCCCTATGTAAGGCAATCAGTAGATGATGGGAAAAAAACATTGCATGATTTAGAAAAAAACAAAGAGAAATATGT
TATCAAAAATGACTAAACTAATAGCATAATTAGAATTTTCATTTGAGTATTTCTTTATAGTTTGTGAGAGATTAAAAAT
TATGTATTATTTTATAAATATATATGGAGGATCTCCTATATACCCAGTCTCAGACTTATTTTGGTGATTATACTCT
GGAACATGTGATTCTTCTCCCTCGTGGGTTAAAAAAATTTATACCATCCTATGGGGTATGACTAATCTGAATCTCA
CACTTGAAATATTACTTTTGGGATCTTAGGCAAGTTATTAAAGAATAAAAAATAACTTACTATGTTTCTCCTCAACTATAA

FIG. 3A

11/16

AATGAGAAATTTAATAATCTTAAACTTACTGTGAAGGATGAAATAATTTCAATAGTATGTAATATGATGCTTAGCA
TACATTAAGATCTCAGTGTATATTAGCAACAAATTTTCAGTAAAGAAAGACCAAAATAATTTTGTCAAGAAATATGAA
TATATAAATATATAGGTTTAAAGTTGTATTTACCATAATTTAATGTGACAGTAAAAAAGTCACGAAAAATGTGTGA
CCTAATAAGTTTATTCAGTTTCTAATGTCCCTGAACCCCTTATCTCAGATGGATTTTGTCTCCAAACTTATAACAAT
AATTACAAACCCCTGACTCTAGTTTCTTCTGAGAGAAAAAATAAATAGAAACACTGTTCTTTTCTTTCCTTTCCTTA
CCTACAGGAATTTACTTACAGAAAAATCTAACTTCTTTTAAAAACAGCCTTAATCCCTTGTGGGCCAAGGAAAA
CTTTTCCATTGTTCTCTGAAGGTTTGTCTAAAAAATAAATACTGTCAAGAGGCAGATCAATAGAAAGAAAGGCATA
CACATTTATTGATCATATAATTTTACACAACCCGAGAGCCTTTAGAACAAAGACCCAAAGTTACAAAAAGAAATTGTC
CATTTTATGCTTAGGTTCAACAAAGTGTGGGCAGGTGTGGAGAAAATACAACCTGGACAAAAAGGAATATGATCTCAT
GCTAACAGACTGAGTGGGGACGCCCTGGCAAGGTGAGATTCTTCTCGTATCTCTGTGCAGTACTCATTCCTTCTGCG
GTATGGGGCAGGACCTTCTTTGGAAATGGGGTCTTATGAGCTACGATCAAAACAAGGTAGGTACAGATAATGTCTTTAT
GGCCAGATTTACACAGAAAGTTGAGGTGTAGAGTGATATGCTTAGGTTTATGGCTGGTTTGGGAAAAAAGGGTT
CTGGTTTCTAGGAGCCACCTTGGGAAAGAGGGATTCTAGTTTCTATGCTCGCCTTGGGGGAGAAATGAAGGGCCGG
AGACTGGAGAGCAGGAGAAAGGTCAGAGAGAGCTGATTCTGAGGTCTTCATTTGGGGTATCATTTTCTGAGCCCT
ACACCCCTAATAAAGCACAAAGAGATGCAGTGGAGCAATTCAGGGTCACGGTCAGGCTATGCATTGAACCTGAGATTTC
CCAAAAAGTCTACTGAACAGTAAAAAAGAAAGTAAATGGATCCTGGGGACACCCAGACAGAGGCTGACAAATGATTT
TTAAGTAAGGAGAAAAATGATAAAGAGAAAGGATTAGCAATAGAAACGGGTCAATAAAATAGATCCCTCAAAAGGA
ATTCTCTTAATCCCTAGCTTCTCTAGATATATCCACAACTCAGGGACTTATCAGGCAGGTGTGTTTTCCCTGAAAG
TGGGGTAAGGAGCTGGAGGACAAATGAAGGTGGTATGTGGAGGGAAGGCTGTCTCTGTGGATGAGTTAATTCAG
CCCCACAAATCACTTCTGTACAGCTACCCACCGCTCTAGTCAATTCACACATTTGGCCCTGCTTTCCTTTCTCTGTGG

FIG. 3B

12/16

ACAGGGCACACTGTTCTCTACTAATATCCATCTCAGAGAGATACAGGGGCAAGTATCCCTCAGCATCCATTAGAAAT
AAAGCAGGCTCTTTGCTTAAAGTTACCAGAGCATCCACCCTCTGGGTGCAAGACAAAATTCTCTGAATCAAGTGAGGG
GTCTGGGCAATGATCTCACAAAGGATTTGATACCTAGGAGTCCCCCATGCCATACAAAGCTCCTCATCTTTCCACT
TACACTTTGGGAAGCTGGCTGTCGTGTACAGGCAGATGAAGCTGGAAGAGAGAGGCATATTCACTACTCACGAATT
CAACACGCTTGAGGGATTTCCGGTGAAAGTCAGTCCCTAACAGTGATACGTATACGTATACACACCAACATGTGTGAAT
GTGTTGTGTGCACGTGTGTCCTGTACAAGTCCACATGGCATATTTACCTGTACAGGACAGGCTATGGACAATGAC
TGTTTCTTGGACTTTCTCTTAAAAAGTCAGATCAGACAAGTTTATTTGTATACCTTTGGGTAATGTGTGGTATTT
CGTGAGTTTGGCAGTTTGTGAAAAAAGAAAAAAGAAAAAAGCTGCCTGCTCTGAGCCCCATGAGGGC
AGGGGCAATTTTTCATCTGACAATCTGCGTGTCTTTTGTGCTTATTTTGGCCCCACAAATACCACACCCCT
TTTCTTAACCTCTTTCTACCTGGGCTGGACGTGCTGGGCTCTCCTCCCTGGCCCCGCTCCACCTCTCTCCCA
GGTCTCTAAACCCCTAGAGAACCTGTGTGTCAGTGTGTTGAATCCCTCAGTTGCTCTAGCAGGAAAACTAGACAGATT
AGGAGCTGGGGCACATTTGGCTGAAAGACAGCTCTTCGCTTTCTTTATGCTGCTTCCCTTCCCTCTTTTCCCAA
ATAGATATAAACAACATGTATTTTCCCTGTTTAAATTGAGCGAATTGGTCCCCCTGCCCTGTGCCCTTGTATTAGCCAT
TGGGCTCAGCCTTGCTCCTCCCTTCTTACTCGGATAGGAGCCACTGGGATCTGGAGCTCCAGCTTCCAAATTGAA
GCTGGCCTCAGGCCAGGTGACCTTTTCTTTGTAAAGTTTCTTTCCCTAAGCGTGGGGTTGGGGGAGGGGGAATGG
GGGGGTTGCAGGGATCTGTTTGGTGTGTTGAAGGGGGGCGAGTGAGGAAAGGAGGGGCTGGAAAGAGAGATAAA
GGGCTGTTGTGTTAAACAGTTTCTTACCGTAAGAGGGAGTTCAGACCTAGATCTTTCCAGTTAATCACACAACAACCT

FIG. 3C

FIG. 3D

14/16

GCAGGTTATCATGCTTGACATGTGTCAATGCTTCAAGGTCGGGTGCGGTGCTCAGCCTGTAATC
CCAGCACTTTGGAGGCCGAGCGGCAGATCACAGGTCAGGAGATTGAGACCATCCTAGCTAACAAAGGTGAAAC
CCTGTCTCTACTAAAAATACAAAAAATTAGCCAGCGTGGTGGCAGGCACCTGTAGTCCCACCTACTTTGGGAGGCT
GAGGCAGGAGACTCTCTTGAACCTGGGAGGTGGGGTTGCAGTGAAGCCGAGATTGTGTCAACCGCACTTCAGCCTGG
GGAACGGAGCAAGACTCCATCTCAAGAAAGAAAGAAAAAATGCTTCACAGATGACTGCTGGTTTAGGGGATTTT
GAGCTTAAATTGAAATAATGGCTAATATTTTGAGGGTTTTCATTTTAAAGATTAAAAATGTCACCTGTTCTTAAGTA
GAATCTGGTTACCTGAATTCATCTGTGCTAACGCAAGGGGAACGCAGTGTGGAACCCCAACAGTAGATCAACCG
TAGGCAGTGTCTATTTTTCGGCATGCATTAATGAACCTTTTGGCAGGAGACATACATTTGTAATTATATTTCACT
TTGCCCTAATGTAGAAATGACTGTGTTTCCCTGAGTACAGGCAGAAATGCAGCCCAAGAGTGTGGCAGGCCAAGGAGAG
TCCAGTTGGGAATTACAAATATGCTGTGAATAATTCCTGAAGTGGATAATCTAAAAATTTGTCAATCAAAAGGAGGGTG
CGCCTTTGTTTAGATGGCCAGTTTGATAGTTTTTTTAAATACCTTTAAAAATAAAAAATATGGGTAGCCTCTTAGA
ACACACAAAGTTTGTCTTTTTTAAATGACATTTAATATGACTATTTAGAGGTTTCTTTTGTGTTACTAGCTTT
GATTATAATTATTTATCTATGAATTTATATTTGTATGTATTTGTAATAATAACACATTTGTTAGGAAAGAAATATATA
CTGTAAGTTGACAAACCAAGTTATCAACAGAAATACACTATGGAGATACTTTTTTAAAGCTTAAAGAAATATTCAATAT
AATGGGCCCCCGCCATCTTTGTAGGAGTTAGCCTATATAGAATTACCCCTCTATTCACTCCCACTACATGGGAAAC
AAATATCCAATCCCTCTGTAAATAAAAGAACATTAAATGAGCACCTAATATTCAAGAGTATGTGGGGATGTAAAGA
TGAACAAATAAGAAAGGAACCTTAAATTTGTTGAGCAACTGATATGAACCAAGTAGTAAAGTACATCTCACTTAATT
CTAATAAG

FIG. 3E

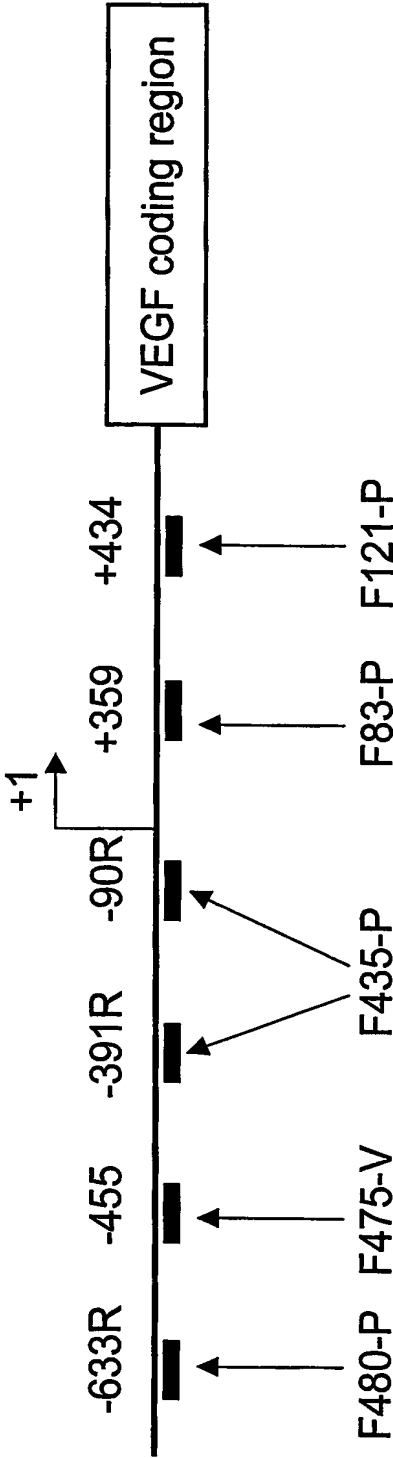


FIG. 4

FIG. 5A

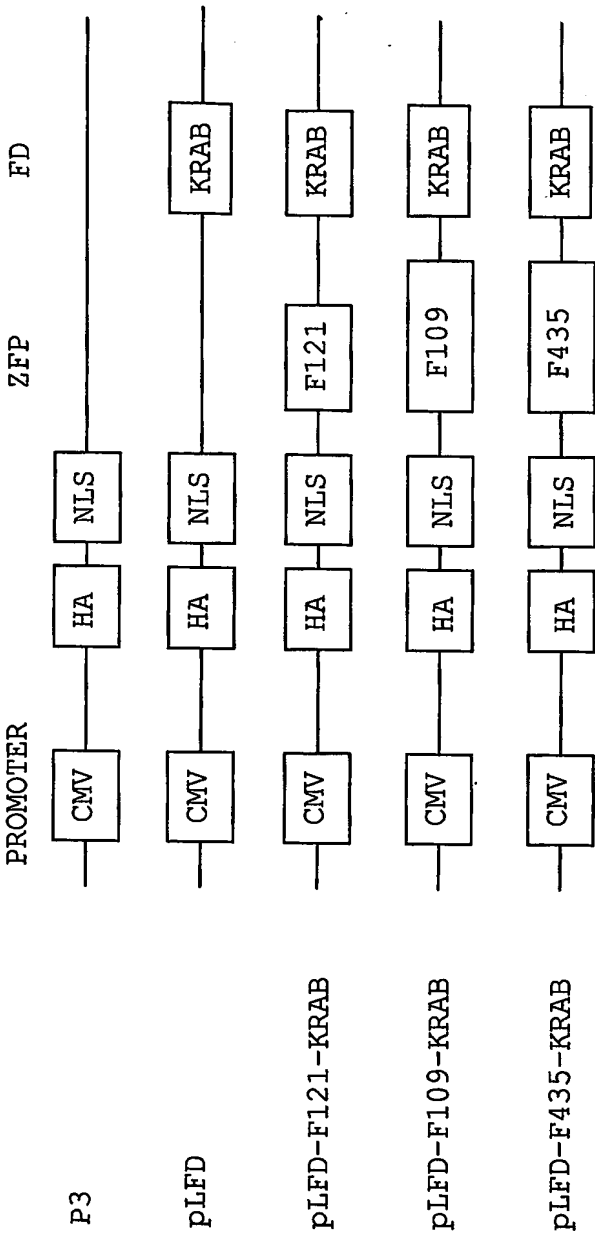


FIG. 5B

